

PROJECT facts

DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
FEDERAL ENERGY TECHNOLOGY CENTER

ADVANCED CLEAN/EFFICIENT
POWER systems

PS004.0697

IMPROVING OUR CONTROL OF MERCURY AND OTHER ENVIRONMENTAL POLLUTANTS

PRIMARY PROJECT PARTNERS

Radian Corporation
Austin, TX

MAIN SITE

**New York State Electric
and Gas, Kintigh Station**

**The Environmental Control
Research Center,
Electric Power Research
Institute (EPRI)**
Barker, NY

Radian Corporation
Austin, TX

Project Description

The 1990 Clean Air Act Amendments started the ball rolling on new regulations for mercury control. Electric-generating utilities may have restrictions on emissions of mercury and other potentially hazardous substances. To gather information on control strategies, the U.S. Department of Energy is working with Radian Corporation of Austin, Texas. Testing has been conducted at the EPRI's 4-megawatt pilot-scale facility located at the New York State Electric and Gas Kintigh Station.

The project investigated and demonstrated innovative modifications to a wet-flue-gas desulfurization scrubber. The versatile test facility was modified to demonstrate control of different forms of mercury under a variety of conditions. The flue gas will come from the Kintigh Station slipstream, and with different flue-gas conditions representing the conditions encountered by utilities in typical full-scale systems.

At bench- and pilot-scale, researchers covered three areas of investigation: direct removal of elemental mercury; conversion of elemental mercury into soluble forms; and removal of particulate hazardous air pollutants across wet flue-gas desulfurization systems. The most promising options will be further developed on a larger scale.

TOTAL ESTIMATED COST

\$3,465,300

COST SHARING

DOE	\$2,512,500
Non-DOE	\$952,800

Program Goal

The Department of Energy has committed to developing, by 2010, power systems that are at least 10 times cleaner than today's standards allow, as well as 50% more efficient. To this end, the Air Toxics and Fine Particulate Emissions-Control program has as its goal assessing and facilitating the development of existing technologies for the control of mercury, its speciated forms, and other hazardous air pollutants. The Radian project does much to achieve this objective. Twenty-five percent of the current electric utility industry, as well as all future plants with wet-flue-gas desulfurization installations, may require such controls if regulations are imposed for mercury resulting from the Environmental Protection Agency studies under Title III of the Clean Air Act Amendments.

IMPROVING OUR CONTROL OF MERCURY AND OTHER ENVIRONMENTAL POLLUTANTS

CONTACT POINTS

O.W. Hargrove

Radian Corporation
Austin, TX
(512) 454-4797
(512) 343-1833 fax
buddy_hargrove@ccmail.radian.com

Thomas D. Brown

U.S. Department of Energy
Federal Energy Technology Center
Pittsburgh, PA
(412) 892-4691
(412) 892-5917 fax
brown@fetc.doe.gov

Project Partners

RADIAN CORPORATION

Austin, TX
(project management)

ELECTRIC POWER RESEARCH INSTITUTE

Palo Alto, CA
(cosponsorship and expertise)

ADA TECHNOLOGIES INC.

Englewood, CO
(precharger operations)

PARSONS POWER

Barker, NY
(ECTC operations)

Project Benefits

Title III of the Clean Air Act Amendments of 1990 charged the Environmental Protection Agency with the responsibility of assessing emissions of 189 hazardous air pollutants in order to determine the impact on public health and the environment. New restrictions could dramatically affect the Nation's utilities, which supply 56% of U.S. electricity. Therefore DOE has assigned a high priority in its Fossil Energy program to studying mercury emissions and possible control strategies for U.S. power plants.

As utilities examine options for complying with regulations, they are challenged to find the most effective and economical methods available. The Radian Corporation project will provide important information on the effectiveness of a new mercury-control strategy. Building on previous DOE-funded investigations of the problem, researchers will demonstrate the value of mercury-control strategies for wet-flue-gas scrubber systems.

Key benefits include:

- Evaluation of various control options for mercury and other hazardous air pollutants, in a versatile facility capable of representing the conditions of wet-flue-gas desulfurization systems in the electric utility industry.
- Identification of novel catalysts for the conversion of elemental mercury to a soluble form allowing removal in a wet-flue gas desulfurization system.
- Identification of the role of fly ash and other flue gas constituents on the oxidation of elemental mercury.
- Provision of ways for the utility industry to meet the pending regulations for mercury and other hazardous air pollutants.

Cost Profile

(Dollars in Thousands)

Department
of Energy*

Private Sector
Partners

Prior Investment	FY95	FY96	FY97	Future Funds
—	\$335	\$503.6	—	\$1,673.9
—	—	\$376.8	—	\$576

* Appropriated Funding

Key Milestones

FY96			FY97	
Testing			Reports	
Laboratory testing begun 11/95	ECTC testing begun 2/96	ECTC testing begun 2/96	Final report 9/97	Phase II selection 10/97